Test Definition: TPO

Thyroperoxidase Ab, S

Overview

Useful For

Aiding in the diagnosis of thyroid autoimmune disorders

Differentiating thyroid autoimmune disorders from nonautoimmune goiter or hypothyroidism

As a diagnostic tool in deciding whether to treat a patient who has subclinical hypothyroidism

Testing Algorithm

See Thyroid Function Ordering Algorithm in Special Instructions.

Special Instructions

- Thyroid Function Ordering Algorithm

Method Name

Chemiluminometric Immunoassay

NY State Available

Yes

Specimen

Specimen Type

Serum Red

Specimen Required

Patient Preparation: For 12 hours before this test do not take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.

Container/Tube: Red top

Specimen Volume: 0.6 mL

Collection Instructions: Red-top tubes should be centrifuged and aliquoted within 2 hours of collection.

Forms

If not ordering electronically, complete, print, and send a General Request (T239) with the specimen.

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum Red	Refrigerated (preferred)	7 days	
	Frozen	30 days	

Clinical and Interpretive

Clinical Information

Thyroperoxidase (TPO) is an enzyme involved in thyroid hormone synthesis, catalyzing the oxidation of iodide on tyrosine residues in thyroglobulin for the synthesis of triiodothyronine and thyroxine (tetraiodothyronine). TPO is a membrane-associated hemoglycoprotein expressed only in thyrocytes and is one of the most important thyroid gland antigens.

Disorders of the thyroid gland are frequently caused by autoimmune mechanisms with the production of autoantibodies. Anti-TPO antibodies activate complement and are thought to be significantly involved in thyroid dysfunction and the pathogenesis of hypothyroidism.

The determination of TPO antibody levels is the most sensitive test for detecting autoimmune thyroid disease (eg, Hashimoto thyroiditis, idiopathic myxedema, and Graves disease) and detectable concentrations of anti-TPO antibodies are observed in most patients with these disorders. The highest TPO antibody levels are observed in patients suffering from Hashimoto thyroiditis. In this disease, the prevalence of TPO antibodies is about 90% of cases, confirming the autoimmune origin of the disease. These autoantibodies also frequently occur (60%Ã¢â‚¬â€œ80%) in the course of Graves disease.

In patients with subclinical hypothyroidism, the presence of TPO antibodies is associated with an increased risk of developing overt hypothyroidism. Many clinical endocrinologists use the TPO antibody test as a diagnostic tool in deciding whether to treat a patient with subclinical hypothyroidism, and Mayo Clinic Laboratories endorses this practice.

See Thyroid Function Ordering Algorithm in Special Instructions.

Reference Values

<9.0 IU/mL

Reference values apply to all ages.

Interpretation

Values above 9.0 IU/mL generally are associated with autoimmune thyroiditis, but elevations are also seen in other autoimmune diseases.

In patients with subclinical hypothyroidism, the presence of thyroperoxidase (TPO) antibodies predicts a higher risk of developing overt hypothyroidism, 4.3% per year versus 2.1% per year in antibody-negative individuals. Furthermore, it raises the concern that such patients may be at increased risk of developing other autoimmune diseases, such as adrenal insufficiency and type 1 diabetes.

The frequency of detectable anti-TPO observed in nonimmune thyroid disease is similar to the 10% to 12% observed in a healthy population with normal thyroid function.

There is a good association between the presence of autoantibodies against TPO and histological thyroiditis.

However, in view of the extensive regenerative capacity of the thyroid under the influence of thyroid-stimulating hormone, chronic thyroid disease may be present for years before the clinical manifestation of hypothyroidism becomes evident, if ever.

Cautions

Moderately increased levels of thyroperoxidase (TPO) antibodies may be found in patients with nonthyroid autoimmune disease such as pernicious anemia, type I diabetes, or other disorders that activate the immune system.

Some patients who have been exposed to animal antigens, either in the environment or as part of treatment or imaging procedure, may have circulating anti-animal antibodies present. These antibodies may interfere with the assay reagents to produce unreliable results.

Clinical Reference

1. Feldt-Rasmussen U: Analytical and clinical performance goals for testing autoantibodies to thyroperoxidase, thyroglobulin, and thyrotropin receptor. Clin Chem 1996;42:160-163

2. Gharib H, Tuttle RM, Baskin HJ, et al: Consensus Statement #1, Subclinical thyroid dysfunction: a joint statement on management from the American Association of Clinical Endocrinologists, The American Thyroid Association, and The Endocrine Society. Thyroid 2005;15:24-28

Performance

Method Description

The Access (BeckmanCoulter DXI 800) thyroperoxidase (TPO) antibody assay is a sequential 2-step immunoenzymatic (sandwich) assay. A sample is added to a reaction vessel with paramagnetic particles coated with thyroperoxidase protein. The serum or plasma TPO antibody binds to the thyroperoxidase. After incubation in a reaction vessel, materials bound to the solid phase are held in a magnetic field while unbound materials are washed away. Protein A-alkaline phosphatase conjugate is added and binds to the TPO antibody. After the second incubation, materials bound to the solid phase are held in a magnetic field while unbound materials are washed away. The chemiluminescent substrate Lumi-Phos 530 is added to the vessel and light generated by the reaction is measured with a luminometer. The light production is directly proportional to the concentration of TPO antibody in the sample. The amount of analyte in the sample is determined from a stored, multipoint calibration curve. The analyte in the calibrator is traceable to international standard WHO 66/387.(Instruction manual: Beckman Coulter Assay, Beckman Coulter Inc., Fullerton, CA 2009)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday through Friday; 6 a.m.-12 a.m.

Saturday; 6 a.m.-6 p.m.

Analytic Time

1 day

Maximum Laboratory Time

3 days

Specimen Retention Time

3 months

Performing Laboratory Location

Rochester

Fees and Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.

Test Classification

This test has been cleared or approved by the U.S. Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

86376

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
TPO	Thyroperoxidase Ab, S	8099-4

Result ID	Test Result Name	Result LOINC Value
TPO	Thyroperoxidase Ab, S	8099-4